TC 0080-06

FINAL REPORT
REMEDIAL INVESTIGATION

BUILDING 253

CAMP NAVAJO
BELLEMONT, ARIZONA

December 1997

Prepared for:

US Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

and

Arizona Army National Guard
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REMEDIAL INVESTIGATION
AT
CAMP NAVAJO

BUILDING 253

FINAL REPORT

Contract DACA05-93-D-0019

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LIST OF ACRONYMS

Acronym	Full Phrase
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Heath Services
AMC	Army Material Comand
APE	ammunition particular equipment
bgs	below ground service
CERCLA	Comprehensive Environmental Response, Compensation, and Liablity Act of 1980
COC	chemical of concern
DNSC	Defencse National Stockpile Center
DRMO	Defense Reutilization and Marketing Office
ESE	Environmental Science and Engineering
GSA	General Services Administration
HA	hand auger
HBGL	Health Based Guidance Levels
HGX	commercial mercury cleaning compound
LDC	Laboratory Data Consultants
mg/kg	milligrams per kilogram
MS	matrix spike
pcf	pounds per cubic feet
PRG	Preliminary Remediation Goals
PCB	polychlorinated biphenyl
QA	Quality Assurance
QC	Quality Control
RI	remedial investigation
RPD	relative percent diference
SS	surface soil
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UST	underground storage tank

SECTION 1
INTRODUCTION

1.1. PURPOSE OF REPORT

This report summarizes the results of the remedial investigation conducted at Building 253 (NAAD 52, NADA 52, AREE 52) (site) at Camp Navajo (formerly Navajo Depot Activity), in Bellemont, Arizona (Figure 1-1). Tetra Tech was retained by the United States Army Corps of Engineers (USACE) to conduct the work described in this report.

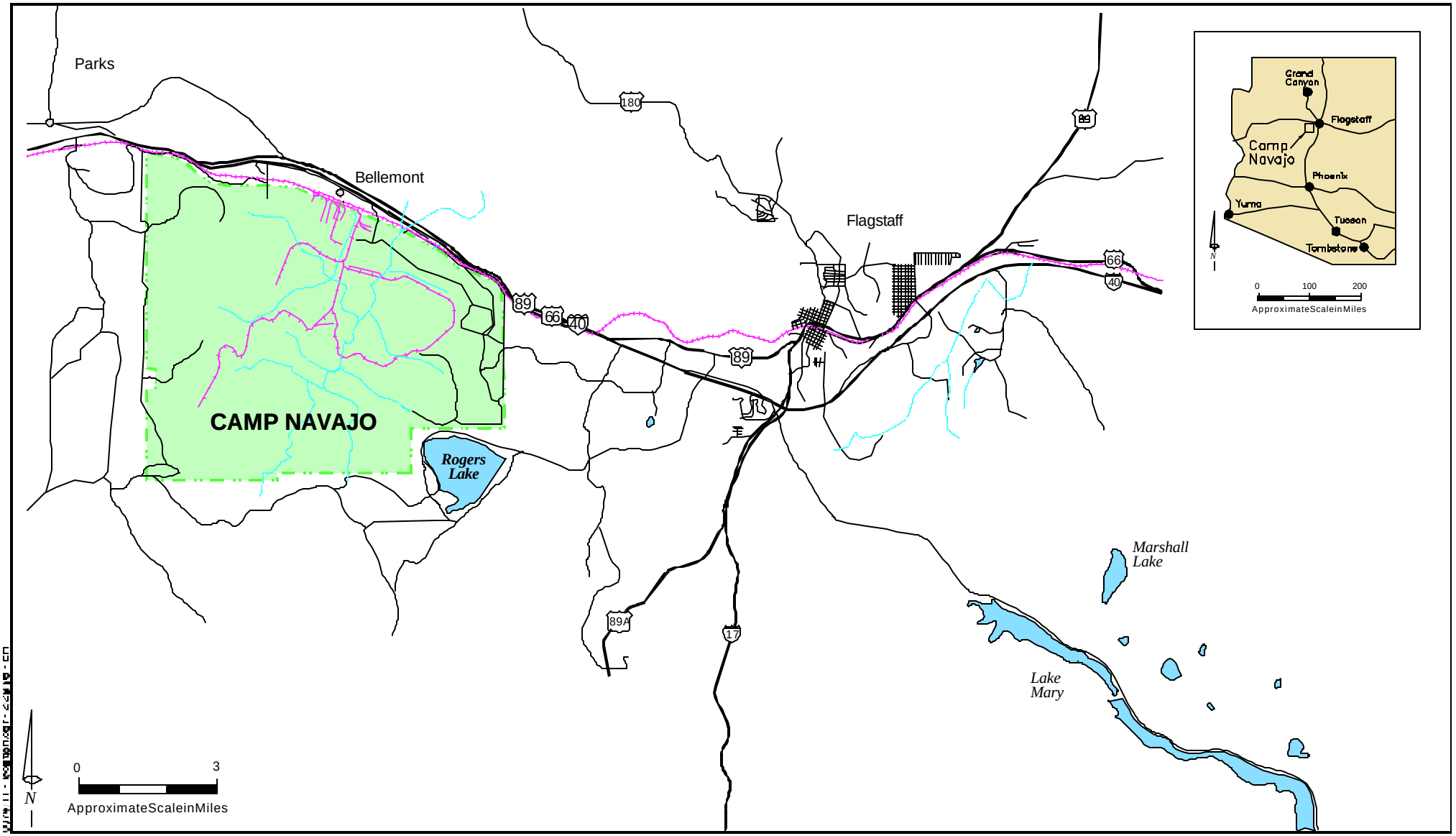
1.2. SITE BACKGROUND

1.2.1. Site Description

Building 253 is a large metal building to the east of Building 244 (Figure 1-2) in the warehouse area (Figure 1-3). The building is a large shed that covers an area of 4,137 square feet and has a gravel floor. The building was used to store polychlorinated biphenyls (PCBs) -containing transformers in overpack drums (ANL 1993).

1.2.2. Previous Investigations

Three surface soil samples were collected from Building 253 in 1989 and analyzed for PCBs. Two samples contained nondetect levels of PCBs (<0.01 parts per million [ppm]), and the third sample contained 0.06 ppm PCBs (as Aroclor 1260) (ANL 1993). The analytical results are shown in Table 1-1. The sample locations within Building 253 are not known. At the time of the ANL visit in 1990, oil staining was observed on the gravel floor. Subsequent to the ANL site visit, the PCB-containing transformers were shipped from the building to the Defense Reutilization and Marketing Office (DRMO) at the Luke Air Force Base Annex (ANL 1993). During a site inspection in 1993, four new transformers were being stored on a pallet in the west end of Building 253 (Uribe 1993).



CampNavajoisinnorthcentralArizona
about12mileswestofthecityofFlagstaff.

LEGEND:

- Highways
- Roads
- Railroad
- Rivers/Streams

Camp Navajo Location Map

Camp Navajo
Bellemont,Arizona

Figure 1-1

Tetra Tech, Inc.

MAPINFO: NAVAJO.WOR

Legend:

- Fence
- Grass
- Railroad

N

0 37.5 75

Approximate Scale in Feet

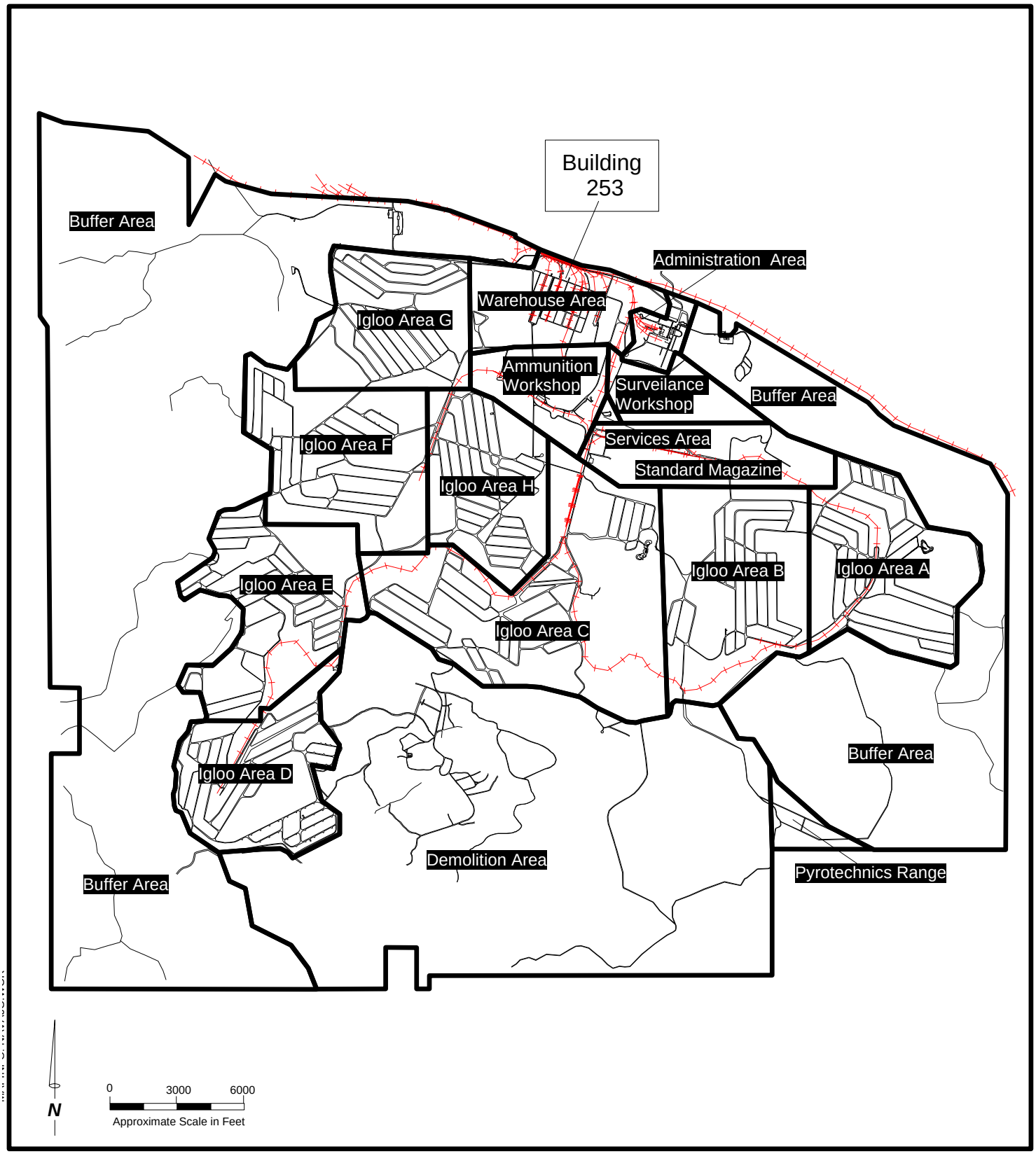
Building 253 - Property Disposal Warehouse

Site Plan

Camp Navajo, Bellemont, Arizona

Figure 1-2

Tetra Tech, Inc.



Building 253 - Property Disposal Warehouse

Site Map

Camp Navajo, Bellemont, Arizona

Figure 1-3

Table 1-1
Previous Investigation Analytical Results - Building 253

Sample Number	Analytical Result (ppm)
N-S1	<0.01
N-S2	<0.01
N-S3	0.06

1.3. STATEMENT OF THE PROBLEM

Previous operations at this site may have resulted in the leakage of PCB-containing oil onto the gravel floor inside the building. Of specific concern at the site is determining the extent of contamination in the soils in the building.

1.4. REPORT ORGANIZATION

This report follows USEPA guidance for remedial investigation (RI) reports in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (USEPA 1988). Section 2 describes the field investigations conducted as part of the RI. Sections 3 and 4 present the physical and chemical results, respectively. Section 5 presents risk screening for the identified contaminants. All results are summarized with conclusions in Section 6.

SECTION 2
SAMPLING PROGRAM

2.1. SAMPLING OBJECTIVES

The specific objectives of the investigation at the Building 253 included characterizing the nature and extent of surface contamination from storage of PCB containing equipment at this site.

2.2. SAMPLING APPROACH

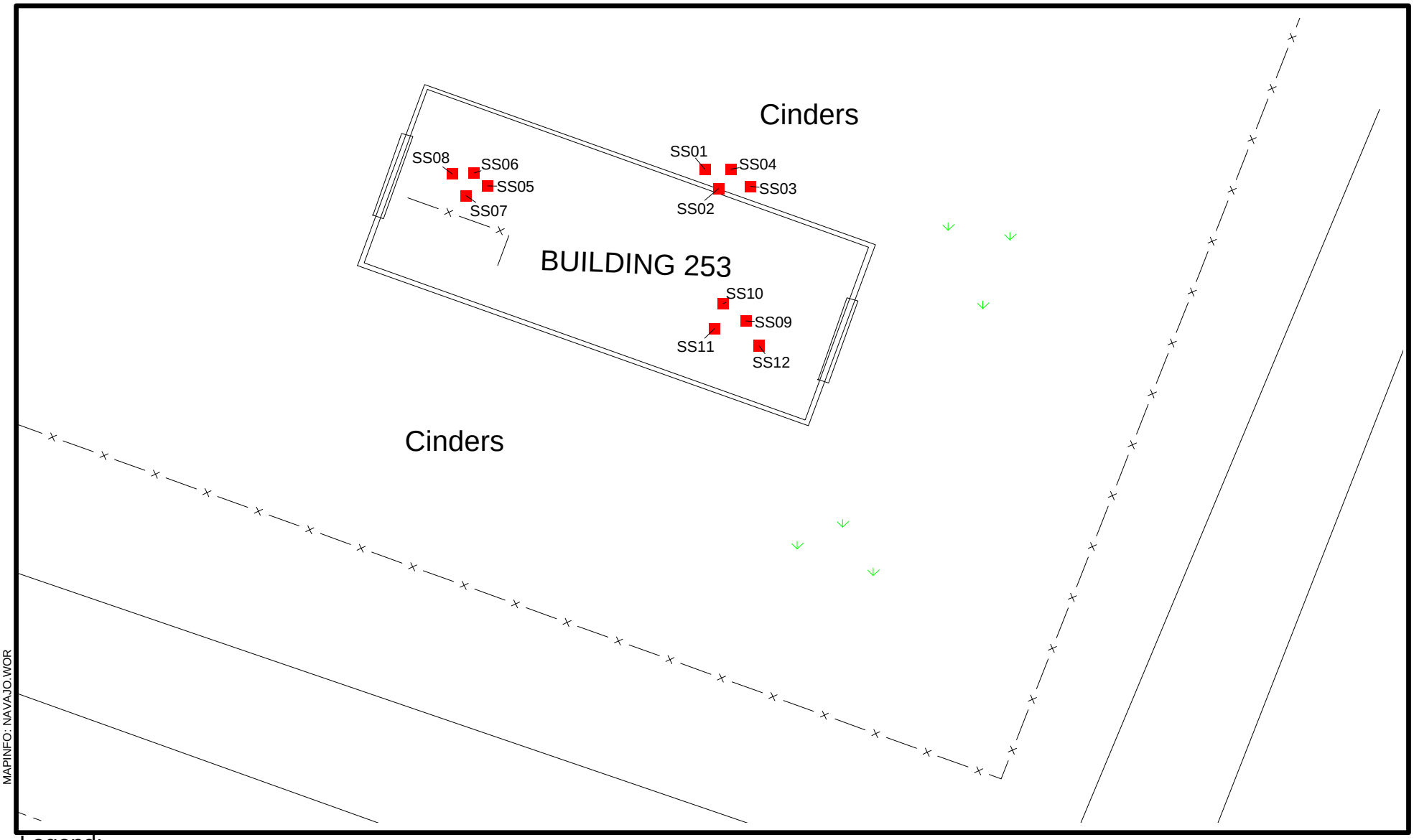
Photo documentation is provided in Appendix A. Field notes are presented in Appendix B. Field investigations were conducted in accordance with the procedures outlined in the field sampling plan provided in Appendix C. Surveyor results can be found in Appendix D.

Task 1: Surface Soil Sampling

Surface soil sampling was performed in targeted locations deemed likely to represent worst case conditions based on engineering judgment. Surface samples were collected from 12 locations within three visually stained areas within Building 253 (Figure 2-1). Surface soil samples were collected by driving a 2-inch by 12-inch California modified split spoon sampler into the ground surface, as described in Appendix C. As shown in Table 2-1, all samples were analyzed for PCBs using a field test kit. Two surface soil samples were randomly selected for laboratory confirmation and were analyzed for PCBs, percent moisture, and pH. One sample also was analyzed for total organic carbon (TOC), redox potential, bulk density and grain size.

Task 2: Surveying

After the investigation was completed, Aztech Surveying, an Arizona-licensed land surveyor, surveyed the horizontal location of the samples. Horizontal coordinates for each location were surveyed relative to a permanent control point established on-site. Horizontal control is accurate to ± 0.1 feet. Sample locations in Figure 2-1 are based on survey results. A table of surveyed sample locations is included in Appendix F.



MAPINFO: NAVAJO.WOR

Legend:

- Fence
- Grass
- Railroad

N

0 15 30

Approximate Scale in Feet

Tetra Tech, Inc.

Building 253 - Property Disposal Warehouse

Investigation Plan

Camp Navajo, Bellemont, Arizona

Figure 2-1

Table 2-1
Building 253 Analytical Requirements

Sample ID	Sample Date	Depth (feet)	Percent Water ASTM D2216	pH SW9040B	Total Organic Carbon WBLACK	Redox Potential ASTM D1498	Dry Density ASTM D2937	Particle-Size Distribution ASTM D422	PCB Test Kit 4020	PCBs SW8081
253-SS01S-01	5/17/96	1	X	X					X	X
253-SS02S-01	5/17/96	1	X	X	X	X	X	X	X	X
253-SS03S-01	5/17/96	1							X	
253-SS04S-01	5/17/96	1							X	
253-SS05S-01	5/17/96	1							X	
253-SS06S-01	5/17/96	1							X	
253-SS07S-01	5/17/96	1							X	
253-SS08S-01	5/17/96	1							X	
253-SS09S-01	5/17/96	1							X	
253-SS10S-01	5/17/96	1							X	
253-SS11S-01	5/17/96	1							X	
253-SS12S-01	5/17/96	1							X	
253-SS03S-01*	5/17/96	1		X	X	X	X	X		X

Notes:

* Blind duplicate sample (See section 4.2

ASTM American Society for Testing and Materials

2.3. SAMPLE ANALYSIS

Thirteen soil samples were collected during this investigation. Twelve samples were analyzed with PCB test kits. Two random soil samples and one duplicate sample were analyzed for PCBs, TOC, redox potential, percent water, and pH by Quanterra Laboratories in California. Two soil samples also were analyzed for bulk density and particle-size distribution by Earth Tech Laboratories in California. Table 2-1 summarizes the samples collected and the types of analyses conducted on each soil sample.

SECTION 3
PHYSICAL CHARACTERISTICS

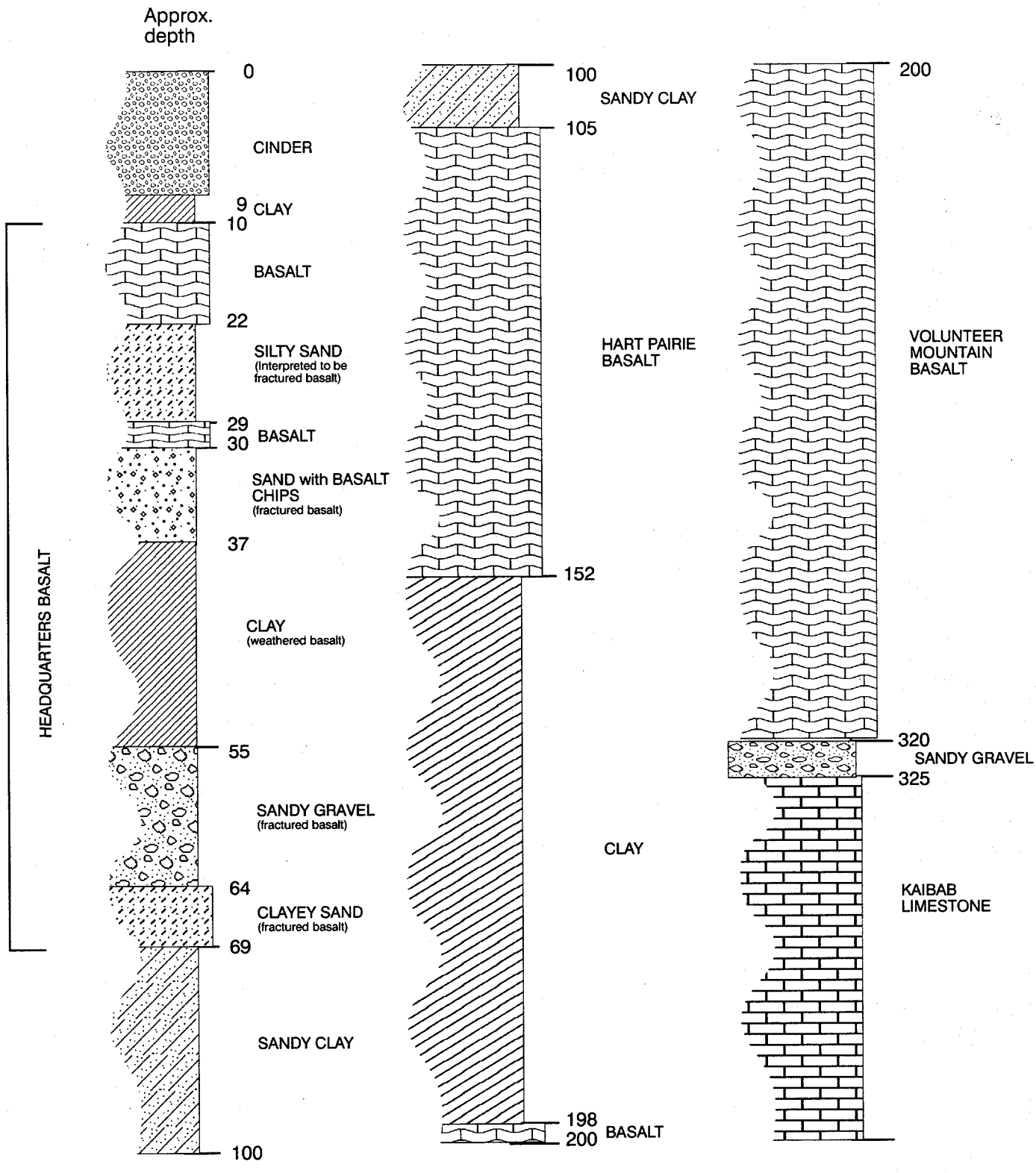
3.1. SURFACE FEATURES

Surface features at the site consist of a 4,029 square foot metal shed adjacent to the end of a rail line. The building is located in the central portion of the warehouse area east of Building 244 (Figure 1-2). Unpaved ground surface surrounding and in the building is covered with gravel or grass.

The topography in the area of Building 253 is generally of low relief, and slopes to the southeast. There is a northeast-southwest trending escarpment approximately 3,000 feet east of the site (Bellemont Fault). This feature has a drop in ground surface elevation of about 80 feet. Ground surface generally consists of clay with less than 50 percent of sand.

3.2. GEOLOGY

The upper 20 feet of soil beneath the site consists of clay with varying amounts of silt, sand, or gravel, ranging from nine to 60 percent. Occasional fine (< six inches thick) layers of sand are evident. The following description of the geologic units deeper than 20 feet is compiled from surface geologic mapping, from soil borings in other portions of the Warehouse Area, and from geophysical surveys (Figure 3-1) (Tetra Tech 1997). A monitoring well drilled in 1996 approximately 1,500 feet southeast of the site encountered a thin veneer (<10 feet) of clayey soil overlying a thickness of basalt. This basalt is interpreted to be the Headquarters Basalt which underlies the entire Warehouse Area as well as the adjacent Administration Area. The flow is estimated to be about 60 feet thick and overlies a thickness (<35 feet) of Camp Navajo Clay. The Camp Navajo Clay was deposited directly on top of a second basalt flow. This second basalt flow is interpreted to be the Hart Pairie basalt and is 45 feet thick. Below the second basalt is a second clay (45 feet thick) and a third basalt. The third basalt is interpreted to be the Volunteer Mountain basalt and is 120 feet thick. Below the third basalt is a thin zone of gravel and weathered Kaibab Limestone (<20 feet) and the underlying Kaibab Limestone.

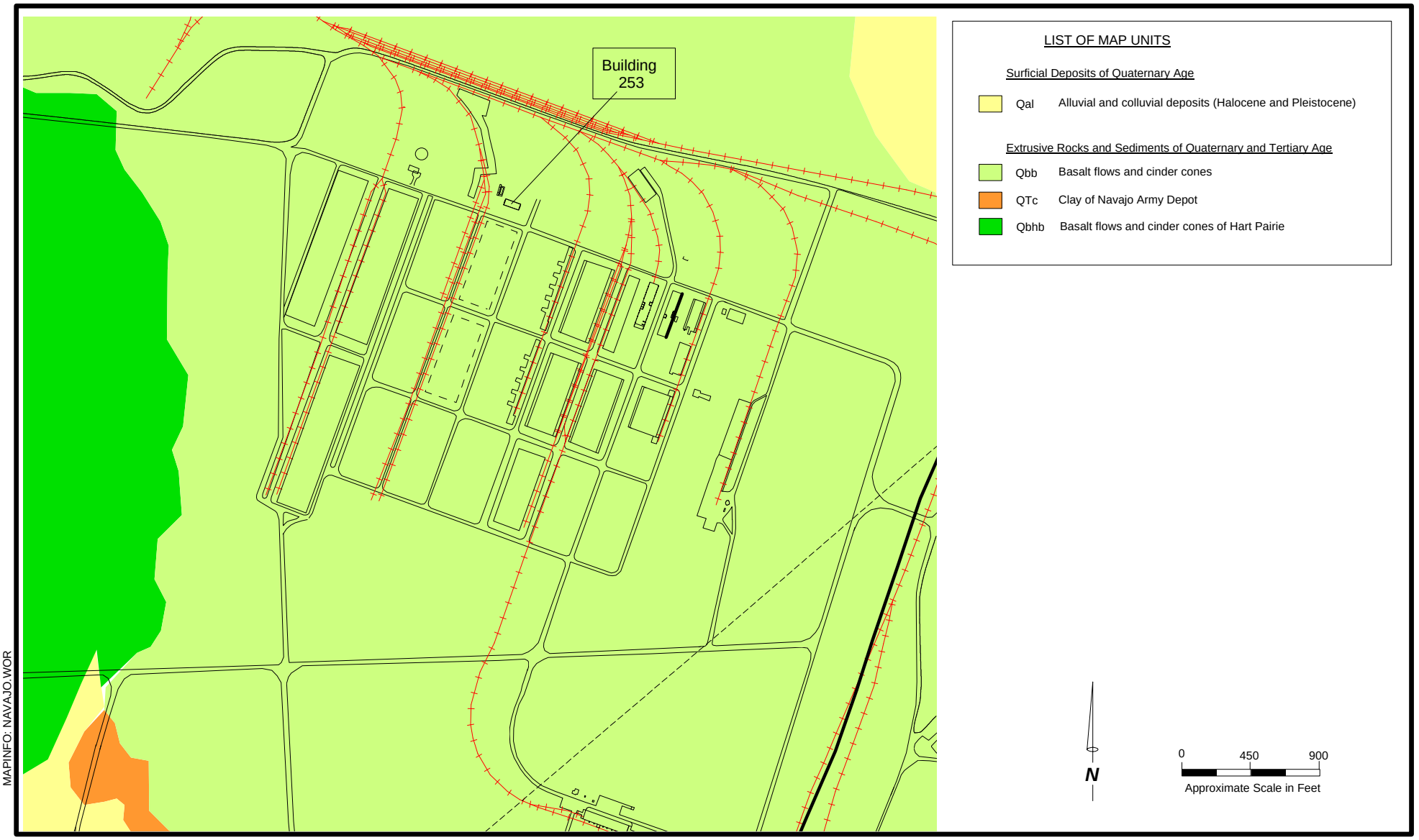


Source: Tetra Tech, 1996

r:\0074\06\253strat.cdr - 12/24/97 - BC

Building 253 Stratigraphy

Camp Navajo
Bellemont, Arizona



MAPINFO: NAVAJO.WOR

Legend:

- Faults
- Lineaments/ Fracture Zones
- Railroad

Warehouse Area Geology

Camp Navajo, Bellemont, Arizona

Figure 3-2

Tetra Tech, Inc.

3.3. SOILS

The soils beneath the site have been classified by the Navajo Army Depot Soil Survey, Coconino County, Arizona as Soil Unit 10 (USDA 1970). Soil Unit 10 soils are moderately deep, gravelly clay soils with a loam surface and usually have zero to five percent slopes. The surface soil is generally a brown, granular loam, having a pH of 7.0 and being three to five inches thick. The subsoil is generally a dark, reddish gray, gravelly clay with a blocky structure, having a pH of 7.8 and being 20 to 30 inches thick. This type of soil forms approximately five percent of Navajo Army Depot soils, which accounts for approximately 1,400 acres of land on the base.

Physical testing of the soil sample collected during this investigation showed moisture at 9.4 percent. Dry densities of the soils at 80.8 pounds per cubic foot (pcf). Grain size distributions at 31 percent gravel, 60 percent sand, and nine percent fines. All physical analysis results are included I Appendix G.

3.4. HYDROGEOLOGY

Four water bearing zones have been identified within the upper 1,500 feet beneath the warehouse area (Tetra Tech, in progress). The uppermost zone, which feeds the springs from which the base receives its water supply, exists in fractures in the bottom of the uppermost basalt flow. The bottom of this zone is marked by a 30 foot thick clay aquitard at a depth of 70 feet bgs. A second water bearing zone exists in fractures at the base of the second basalt flow and is bounded on the bottom by a second clay aquitard at a depth of 150 feet bgs. A third water bearing zone exists in a 50 foot thick deposit of stream gravels and volcanic cinder that directly overlies the Kaibab Limestone at a depth of 350 feet bgs. The fourth water bearing zone is the regional aquifer in the Coconino and Supai Formations at a depth of about 1,300 feet bgs.

Ground water recharge to the various water bearing zones occurs along fractures in the basalt flows and through fractures in the underlying Kaibab limestone. The presence and lateral continuity of the aquitards suggests that downward migration does not occur homogeneously throughout the area but is limited to areas of fracturing and faulting. In addition, the existence of the water bearing zones within fractures in the basalt suggests that contaminant migration would not be predictable using standard hydrogeologic techniques. Thus, remediation of contaminants in the ground water within the basalt zones would be problematic.

SECTION 4
NATURE AND EXTENT OF CONTAMINATION

The following section summarizes the nature and extent of contamination identified at Building 253. All field test kit results are in Appendix E. All analytical results are tabulated by analysis method in Appendix F. Soil physical characteristics are in Appendix G. Appendix H includes copies of all laboratory reports for this site.

4.1. SURFACE SOILS

No PCBs were detected in any of the test kit samples analyzed at the site. No PCBs were identified above Arizona Department of Environmental Quality (ADEQ) nonresidential Health Based Guidance Levels (HBGL) in the confirmation samples submitted to the fixed laboratory.

4.2. QA/QC

Three samples were sent to Quanterra Incorporated (Quanterra) of Santa Ana, California for inorganic and organic parameter analyses. Temperature blanks for all coolers forwarded to the laboratory were within an acceptable range and all coolers arrived with custody seals intact. Applicable holding times were met for all analyses. One field duplicate sample, this being a surface soil (SS) sample, was collected at the site during the investigation as shown below. Validation of the data was conducted by Laboratory Data Consultants, Inc., (LDC) of Carlsbad, California.

253-SS03S-01 blind duplicate of 253-SS02S-01

Evaluation of field duplicate results for the PCB analyses indicated excellent qualitative and quantitative agreement between reported results. All analytical values reported for the field duplicate pair were below the respective sample quantitation limits. Therefore, all field duplicate results were deemed acceptable with no adverse effects on overall data quality expected. All other PCB data for submitted samples, including immunoassay field screening results, were determined to be valid without qualification and considered useable for all purposes.

SECTION 5
RISK SCREENING

Current activities and activity patterns at the site are considered part-time commercial/industrial, as are the documented uses of land surrounding the site. Therefore, for purposes of this risk screening, land use of the site is assumed to be industrial. Previous operations at the site have indicated semivolatile PCB compounds to be the principal chemicals of concern (COCs) posing a potential exposure risk to workers involved in commercial/industrial activities onsite.

Laboratory results for this group of COCs show no detectable concentrations of PCBs contained in surface soils onsite. In addition, no PCBs were detected in the twelve surface soil samples tested at the site using immunoassay screening methodology. Therefore, all results are below the respective Health Based Guidance Levels (HBGLs) developed by the Arizona Department of Health Services (ADHS) for ADEQ using non-residential exposure assumptions. As a result, these chemicals have been excluded as COCs since they are not indicated to be present at concentrations high enough to pose a potential exposure risk or health threat during onsite commercial/industrial activities.

Consequently, results of the overall risk screening indicate that the reported concentrations of identified contaminants in soils at the site would not be expected to result in adverse health effects relevant to commercial/industrial land use. This determination incorporates the most current ADEQ, USEPA and USACE "acceptable" target risk criteria into its approach and is intended to be a "health-conservative" evaluation of potential risk and hazard.

SECTION 6
SUMMARY AND CONCLUSIONS

6.1. SUMMARY

No contamination has been identified in Building 253.

6.2. CONCLUSIONS

All data collected during this investigation meet acceptable QA/QC standards and are considered to be representative of site conditions. Therefore, based on the lack of detected contamination exceeding either HBGLs or risk screening levels, no further action is warranted. This site has been closed by the Arizona Department of Environmental Quality. A copy of the closure letter is included in Appendix K.

SECTION 7
REFERENCES

Argonne National Laboratory (ANL). 1993. *Master Environmental Plan. Navajo Army Depot Activity, Bellemont, Arizona*. October 1993.

Arizona Department of Health Services (ADHS). 1997. *Arizona Soil Remediation Levels*. Prepared for the Arizona Department of Environmental Quality in accordance with A.R.S. §§ 49-151 and A.R.S. §§ 49-152.

Tetra Tech, Inc. 1997a. *Draft Report Geophysical Investigation, Camp Navajo, Bellemont, Arizona*. Tetra Tech, Inc. San Francisco, California. March 1997.

_____. In progress. *Draft Ground Water Investigation, Camp Navajo, Bellemont, Arizona*. Tetra Tech, Inc. San Francisco, California.

US Department of Agriculture (USDA). 1970. *Soil Survey of Navajo Army Depot, Coconino County Arizona: A Special Report*. January 1970.

Uribe and Associates (Uribe). 1993. *Revised Preliminary Review Report, Navajo Depot Activity. Contract 68-W2-0016/9-92-1-1077*.

US Army Corps of Engineers (USACE). 1995. *Risk Assessment Handbook: Volume: I Human Health Assessment (EM200-1-4)*. June 30, 1995.

US Environmental Protection Agency (USEPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*.

_____. 1989. *Risk Assessment Guidance (RAGS) for Superfund: Volume: I Human Health Evaluation Manual (PB90-155581)*. December 1989.

_____. 1992. *Guidance for Data Useability: Parts A and B Final Report (PB92-963356)*. April 1992.

_____. 1996. *Preliminary Remediation Goals (PRGs)*. Region IX. August 1996.

APPENDIX A

PHOTO DOCUMENTATION

Photos Building 253

5-2 Panorama Former Open Air HW Storage Area (Shot 3 of 3), NE, 7/23/94, by Brad Hall

49-13 Bldg 253-SS01-04, NW, 5/15/96, by Kali Bronson

49-14 Bldg 253-SS05-01, S, 5/15/96, by Kali Bronson

49-15 Bldg 253-SS09-01, S, 5/15/96, by Kali Bronson


'96 5 15

APPENDIX B

FIELD NOTES

APPENDIX C

STANDARD OPERATING PROCEDURES

SECTION 1
SURFACE-SOIL SAMPLING

1.1 Purpose

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures for collecting representative surface samples. Analysis of surface samples can determine whether concentrations of specific surface pollutants exceed established action levels, and if the concentrations of soil pollutants present a risk to public health, welfare, or the environment.

Materials exposed on the land surface, including soils, sediments, and wastes, are subject to disturbance by weather conditions, vehicle traffic, bioturbation, and other effects. Because volatile contaminants are unlikely to be present in surficial materials, it generally is not necessary to obtain undisturbed samples from the surface. An exception to is when surface samples are collected from beneath an impermeable surface, such as a road or building slab. Surface soils are typically very heterogeneous in compositions and texture, and chemical concentrations in surface soils may vary dramatically over short depth intervals. Often, the first few inches of soil contain gravel, vegetation, or debris. It is desirable to use a sampling method that reduces the impacts of these heterogeneities without biasing the results.

For surface-soil sampling, some judgment may be needed to identify the ground surface datum. The objective is to sample the soil matrix and avoid collecting rock and plant material to the extent possible. Vegetation will be moved aside, dense vegetative matting, detritus or roots will be removed, and gravel will be scraped away to expose the ground surface. Surface samples from beneath pavement or concrete slabs will be collected after first removing road base and gravel to expose the underlying soil. In some locations, such as in the basements of buildings, the ground surface will be below grade. In these cases, depth below grade will be measured and recorded.

1.2 Technique - Description

Soil samples may be collected using a variety of methods and equipment. The methods and equipment used are dependent on the type of sample required (disturbed versus undisturbed) and the type of soil. Samples that do not need to be undisturbed may be easily sampled using a spade, trowel, or scoop. Collecting undisturbed samples may be performed using a hand-auger, a trier, or a split-spoon sampler.

1.3 Procedures

1.3.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.

2. Obtain necessary sampling and air monitoring equipment.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare schedules, and coordinate with staff, client, and regulatory agencies as appropriate.

5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

6. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations will be cleared for underground utilities by the property owner prior to soil sampling.

1.3.2 Interferences and Potential Problems

There are two primary interferences or potential problems associated with soil sampling. These are cross-contamination of samples and improper sample collection methods. Cross-contamination can be eliminated or minimized through the use of sampling equipment dedicated to each sample location. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection methods include using contaminated sampling equipment, disturbing of the matrix causing in compaction of the sample, or inadequate homogenizing of the samples where required, which results in variable, non-representative analytical results.

1.3.3 Sampling Considerations

This method can be used in most soil types. Surface soil samples may be collected with spades, shovels, or scoops. Surface material can be removed to the required depth with this equipment, then a stainless steel or plastic scoop can be used to collect the sample.

Accurate, representative samples can be collected with this procedure depending on the care and precision taken. A flat, pointed mason trowel can be used to cut a block of

the desired soil when undisturbed profiles are required. A stainless steel scoop, lab spoon, or plastic spoon will suffice in most other cases. Avoid the use of devices plated with chrome or other materials. Plating is particularly common with garden implements such as potting trowels.

Follow these procedures to collect surface-soil samples.

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.

2. Using a pre-cleaned, stainless-steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.

3. If the sample is to be analyzed for volatile organics, volatile organic analysis is to be performed, transfer a portion of the sample directly into an appropriate, labeled sample container(s) with a stainless-steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogeneous sample representative of the entire sampling interval. Then, place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly.

1.3.4 Sample Containers and Preservation Techniques

In order to ensure proper sample preservation, samples should be refrigerated to 9°C or less and holding time should be kept to a minimum.

1.3.5 Field Quality Control Sampling Procedures

There are no specific quality-assurance activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.

- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior and after sampling/operation and they must be documented.

1.3.6 Decontamination Procedures

All sample equipment that comes into contact with soil or water must be decontaminated prior to sampling. Decontamination procedures for sampling equipment are described in the Decontamination of Field Equipment SOP.

APPENDIX D

SURVEYOR RESULTS

siteid	PTID	Northing	Easting	Elevation
253	SS01	29252.07	18843.15	
253	SS02	29247.83	18846.11	
253	SS03	29248.33	18853.05	
253	SS04	29252.12	18848.76	
253	SS05	29248.49	18795.9	
253	SS06	29251.3	18792.92	
253	SS07	29246.34	18791.27	
253	SS08	29251.13	18788.13	
253	SS09	29218.92	18852.39	
253	SS10	29222.72	18847.43	
253	SS11	29217.27	18845.62	
253	SS12	29213.47	18855.36	

APPENDIX E

FIELD TEST KITS

APPENDIX F

ANALYTICAL RESULTS TABLE

Description of Qualifiers

J Data are considered quantitatively estimated.

J+ Data are considered quantitatively estimated with a possible high bias.

J- Data are considered quantitatively estimated with a possible low bias.

N Data are considered quantitatively presumptive due to tentative analyte identification.

NJ Data are considered quantitatively presumptive due to tentative analyte identification; the associated value is considered quantitatively estimated.

R Data are rejected and considered unusable for all purposes.

U Analyte is considered not present above the level of the associated value.

UJ Analyte is considered not present above the level of the associated value; the associated value is considered quantitatively estimated.

UJ- Analyte is considered not present above the level of the associated value; the associated value is considered quantitatively estimated with a possible low bias.

Building 253
Remediation Parameters

Sample ID	Sample Date	Depth	pH	Percent Water	Total Organic Carbon	Redox Potential
		CRQL			0.025	
		Units	PH UNITS	PERCENT	PERCENT	mV
253-SS01S-01	5/17/96	1	7.3	1	na	na
253-SS02S-01	5/17/96	1	8.8	5	0.54	290
253-SS03S-01	5/17/96	1	8.7	7.3	0.39	280

Building 253
Polychlorinated Biphenyls (PCBs)

Sample ID	Sample Date	Depth	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane	Total PCBs	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242
		CRQL	0.0033	0.0033	0.0033	0.0017	0.0017	0.0017	1	0.033	0.067	0.033	0.033
		Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
253-SS01S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	<0.0019	<0	<0	<0
253-SS02S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	<0.0019	<0	<0	<0
253-SS03S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	<0.0019	<0	<0	<0
253-SS04S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS05S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS06S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS07S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS08S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS09S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS10S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS11S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS12S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
253-SS03S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyses	0	0	0	0	0	0	12	3	3	3	3
Detections	0	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	23.9	17	17	0.34	0.92	4		0.76	0.76	0.76	0.76
Arizona HBGL - Nonresidential Hits	0	0	0	0	0	0		0	0	0	0

Building 253
Polychlorinated Biphenyls (PCBs)

Sample ID	Sample Date	Depth	Aroclor 1248	Aroclor 1254	Aroclor 1260	beta-BHC	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde
		CRQL Units	0.033 mg/kg	0.033 mg/kg	0.033 mg/kg	0.0017 mg/kg	0.0017 mg/kg	0.033 mg/kg	0.0017 mg/kg	0.033 mg/kg	0.033 mg/kg	0.033 mg/kg	0.033 mg/kg
253-SS01S-01	5/17/96	1	<0	<0	<0.0024	NA	NA	NA	NA	NA	NA	NA	NA
253-SS02S-01	5/17/96	1	<0	<0	<0.0024	NA	NA	NA	NA	NA	NA	NA	NA
253-SS03S-01	5/17/96	1	<0	<0	<0.0024	NA	NA	NA	NA	NA	NA	NA	NA
253-SS04S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS05S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS06S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS07S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS08S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS09S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS10S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS11S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS12S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253-SS03S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyses	3	3	3	0	0	0	0	0	0	0	0	
Detections	0	0	0	0	0	0	0	0	0	0	0	
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0	
Arizona HBGL - Nonresidential	0.76	0.76	0.76	3.19	3.19	0.38	2450	2450		123		
Arizona HBGL - Nonresidential Hits	0	0	0	0	0	0	0	0		0		

Building 253
Polychlorinated Biphenyls (PCBs)

Sample ID	Sample Date	Depth	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
		CRQL	0.033	0.0017	0.0017	0.0017	0.0017	0.017	0.17
		Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
253-SS01S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS02S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS03S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS04S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS05S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS06S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS07S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS08S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS09S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS10S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS11S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS12S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA
253-SS03S-01	5/17/96	1	NA	NA	NA	NA	NA	NA	NA

Analyses	0	0	0	0	0	0	0
Detections	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential		4	4	1.3	0.63	2030	5
Arizona HBGL - Nonresidential Hits		0	0	0	0	0	0

APPENDIX G

SOIL PHYSICAL CHARACTERISTICS

APPENDIX H

QUANTERRA CERTIFICATES OF ANALYSIS

Note: Certificates of Analysis are not included in the Final Reports. Certificates of Analysis will be provided in select copies of the Final Report. For access to a complete copy of the Certificates of Analysis, please contact the Camp Navajo Environmental Office at (520) 773-3208.

APPENDIX I

SCOPE OF WORK

APPENDIX J

COMMENTS AND RESPONSES

APPENDIX K

ADEQ ACCEPTANCE LETTER